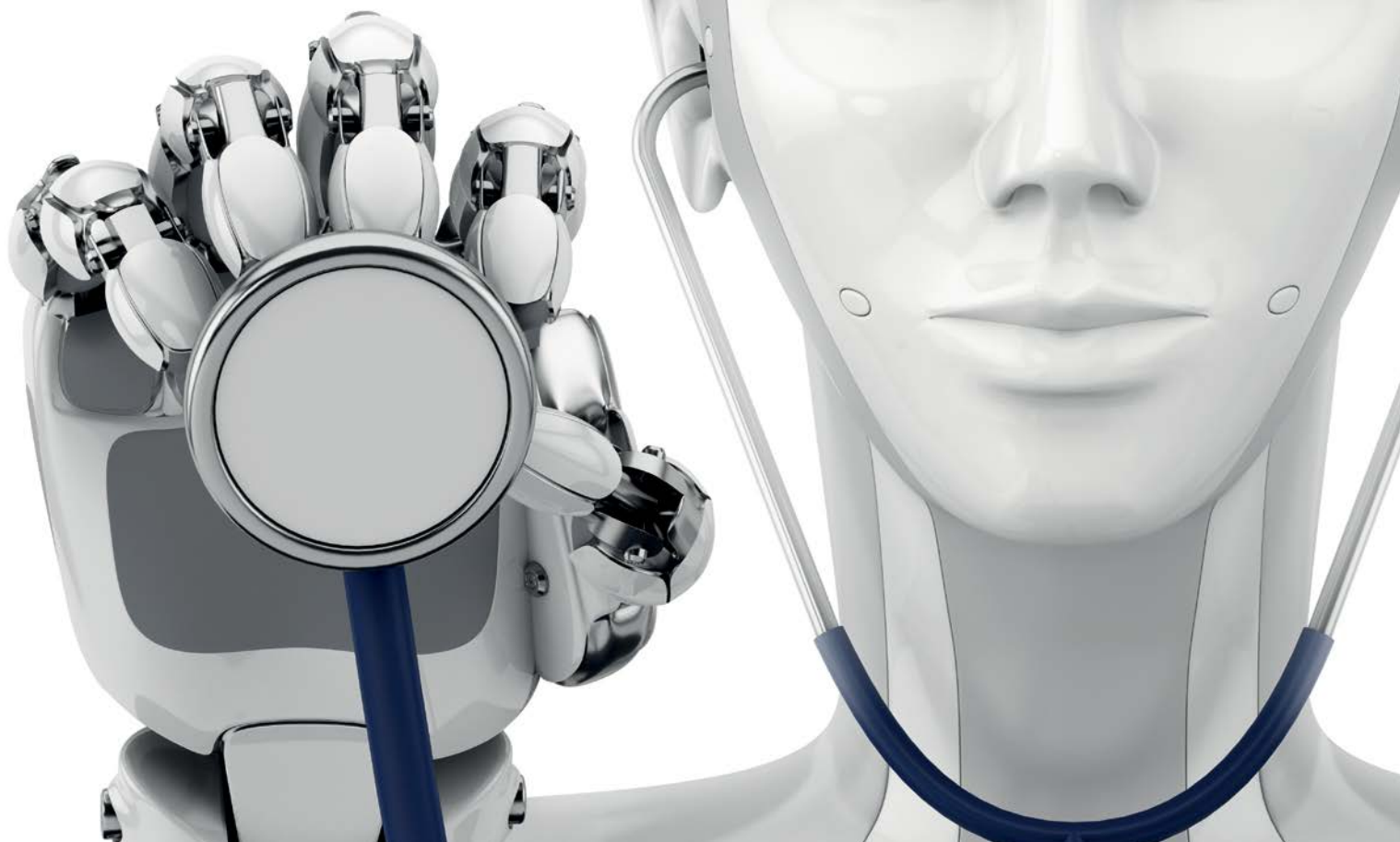




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THE FUTURE OF ARTIFICIAL
INTELLIGENCE IN MEDICINE



ALSO INSIDE

04 **BEAT BURNOUT**
HIGH IMPACT ACTIONS

10 **RECORDS**
MANAGE THE RISKS

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Welcome to your FYi

WHETHER it's seeing a new patient, documenting a ward round or assessing a patient individually, trainee doctors' clinical entries form the cornerstone of the medical records for most hospital patients. With such hectic schedules it is crucial to resist the temptation to cut corners. My article on [page 10](#) offers practical advice on common risk areas.

Is artificial intelligence the key to improving healthcare in the future? On [page 12](#), doctor turned AI advocate Matt Fenech believes that, while there is huge potential for technology, it will be some time before robots replace flesh and blood clinicians.

Dealing with stress is a hot topic for trainees and on [page 4](#) we look at a new initiative outlining eight "high impact" actions to beat burnout.

Speaking up to question a senior colleague's decision can be tricky but failing to do so

could cost lives. Risk adviser Alan Frame talks authority gradients on [page 6](#).

We've all heard of placebos but do you know their fascinating history? Dr Allan Gaw goes back to pre-revolutionary France to tell us more on [page 5](#).

On the topic of history, the WHO's Surgical Safety Checklist marks its 10th anniversary this year. Jim Killgore takes a closer look at this life-saving initiative on [page 7](#).

From stroke care and infectious diseases to managing meningitis and multiple sclerosis, neurology is a challenging and varied specialty. Read all about it in our career article on [page 8](#).

Finally, our case study on [page 14](#) examines an alleged delayed referral in a hysterectomy patient with a slow-healing wound.

• **Dr Naeem Nazem**
Editor

MAJORITY OF HOSPITAL PATIENTS POSITIVE ABOUT CARE, SURVEY SHOWS

THE majority of hospital inpatients in England were happy with the care they received but those with a mental health condition highlighted areas for improvement, a new survey has found.

Most patients said they had confidence in the doctors and nurses treating them and had a better overall experience compared to previous years.

However, they were less positive about arrangements and information received when leaving hospital. Those with a mental health condition also reported a poorer than average experience in a number of areas.

The Care Quality Commission's (CQC) annual national patient survey asked more than 70,000 adults across every NHS acute trust in the country about the care they received.

The responses to the 2017 survey show a number of improvements, particularly in relation to patient's interactions with hospital staff. In 2017, the majority (82 per cent) thought they were 'always' treated with respect and dignity, (compared to 78 per cent in 2009) and slightly more people said they 'always' had confidence in the nurses treating them (78 per cent in 2017 compared to 77 per cent in 2016 and 72 per cent in 2009).

In contrast, patients aged 16 to 35, those with dementia or Alzheimer's disease and those with a mental health condition reported having less confidence and trust in the staff caring for them.

Chief inspector of hospitals Professor Ted Baker said it was "encouraging" to see some areas of improvement and praised healthcare professionals who worked "tirelessly" to provide high quality care.

But he noted the "continued disparity" between the experiences of those with a mental health condition and those without and said hospitals must address the issue.

PRAISE FOR SCOTTISH MEDICAL SCHOOLS RECRUITMENT

MEDICAL schools in Scotland have been praised by the General Medical Council for innovative schemes to recruit students from disadvantaged and diverse backgrounds.

The regulator commended all five schools for working together on initiatives designed to widen access to those on a low income and those from ethnic minorities.

At Glasgow School of Medicine more than a fifth of students are from poorer backgrounds thanks to programmes such as summer schools and a pre-medical course which guarantees entry following successful examinations.

Aberdeen School of Medicine also has an outreach programme to help students from deprived backgrounds by guaranteeing entry should they meet the minimum academic requirements for the course. They also help students in remote and rural areas through the innovative use of information technology to aid their learning.

In its review of medical education and training north of the border, the GMC said: "The Scotland Deanery and NES deserve great credit for the support they provide to the boards and medical schools."



UK INDEMNITY, ADVICE & SUPPORT

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RISE IN EMERGENCY READMISSIONS FOR "PREVENTABLE" CONDITIONS

EMERGENCY hospital readmissions for "potentially preventable" conditions have risen by 41 per cent in the last seven years, according to analysis from the Nuffield Trust.

The study found that over the period from 2010/11 to 2016/17 there was an overall 19 per cent rise in patients being readmitted to hospital in an emergency within 30 days of discharge – but with a much higher rate in conditions classified as "potentially preventable". These readmissions include conditions not diagnosed when patients were first admitted to hospital, such as pneumonia, pressure sores and venous thromboembolism (VTE).

Patients readmitted to hospital in an emergency with pneumonia increased by 72.5 per cent – greater than an overall increase in pneumonia cases. The number of patients readmitted with venous thromboembolism grew by 36 per cent, and emergency readmissions for pressure sores almost trebled, superseding the overall increase in the number of pressure sore diagnoses in hospital.

The authors of the study suggest that changes in hospital coding practices and a rapidly expanding older and frailer population may be partly to blame for the increase but they believe that the findings highlight

opportunities for local health providers and policy makers to target quality improvement efforts.

Briefing author Jessica Morris, Research Analyst at the Nuffield Trust, said: "Emergency readmissions to hospital, for conditions that were not diagnosed during their first visit, are potentially a warning sign that a patient's quality of care may have been compromised.

"The findings provide local health providers with a good opportunity to sit up and focus their attention and quality improvement initiatives on the three conditions where we've seen the most significant rise in readmissions."

VISA CAP CHANGE TO TACKLE NHS RECRUITMENT GAP

IMMIGRATION rules are to be relaxed in a bid to attract more healthcare professionals to the UK, the Home Office has announced.

The government plans to exclude doctors and nurses from the cap on skilled non-EU workers following appeals from health leaders.

This means there will be no restriction on the numbers of doctors and nurses who can be employed through the tier 2 visa route, which currently has an annual limit of 20,700.

The number of applications has exceeded the number of available visas every month since December 2017, with the NHS accounting for 40 per cent of all tier 2 places. Despite ongoing reports of recruitment shortages within the health service, more than 1,500 doctors were refused a visa between December 2017 and March 2018.

Excluding doctors and nurses will free up hundreds of tier 2 spaces a month for other professionals applying to work in the UK.



GMC REDUCES ANNUAL RETENTION FEES

NEWLY qualified doctors will save up to £1,000 on their annual retention fee (ARF), the General Medical Council has announced.

Those applying for provisional registration from April 1, 2018, or who have recently held provisional registration will save £40 on the provisional fee or £50 on the full registration fee.

Doctors who join the register within five years of gaining their primary medical qualification and do not hold, or have not previously held, provisional registration will save £50 on their full registration fee and £275 on their ARF for the forthcoming year, until they have been qualified for more than five years.

Doctors with a gross annual worldwide income less than £32,000 can apply for an income discount.

All other registered doctors with an annual retention fee date of April 1 or later will pay £390 instead of £425 this year.

Find out more at tinyurl.com/yd68j79l



A new initiative offers eight quick ways doctors in training can beat burnout

MAKING AN **IMPACT**

LONG hours and heavy workloads seem to have become a fact of life for trainee doctors, with many suffering from low morale and burnout.

Results from the General Medical Council's (GMC) latest annual national training survey found that three-quarters of trainees were working beyond their rostered hours each week to fit in additional duties, while 40 per cent rated the intensity of their work by day as "heavy" or "very heavy". More than a fifth (22 per cent) of trainee doctors said they felt short of sleep while at work.

For the first time, the regulator asked specific questions about the impact of burnout and exhaustion in its 2018 survey in a bid to identify areas for improvement.

Sleep deprivation is a key problem that has not been far from the headlines. An inquest into the 2015 death of Suffolk doctor Ronak Patel found he had crashed his car after falling asleep at the wheel while driving home from a third consecutive nightshift. Despite this and other similar high-profile cases, a 2016 survey for *HSJ* magazine found many doctors were actively discouraged from taking naps.

But one new initiative from the Faculty of Medical Leadership and Management (FMLM) hopes to tackle low morale, high attrition and burnout with its report *Eight high-impact actions to improve the working environment for junior doctors*.

While the actions are designed to be

implemented quickly, FMLM says: "Meaningful improvements will require engagement locally between trusts and doctors in training, along with support from senior clinicians and, in some instances, investment of resources."

But it adds that "the benefits to staff engagement, performance, cost savings and most importantly patient care and reduction of harm will provide a worthwhile return."

The initiative, run in conjunction with NHS Improvement and NHS Providers, has received the backing of national medical bodies including the British Medical Association, the General Medical Council and the Royal College of Physicians (RCP).

RCP president Professor Jane Dacre says the actions are "incredibly useful for trainees and senior colleagues alike."

The action points are:

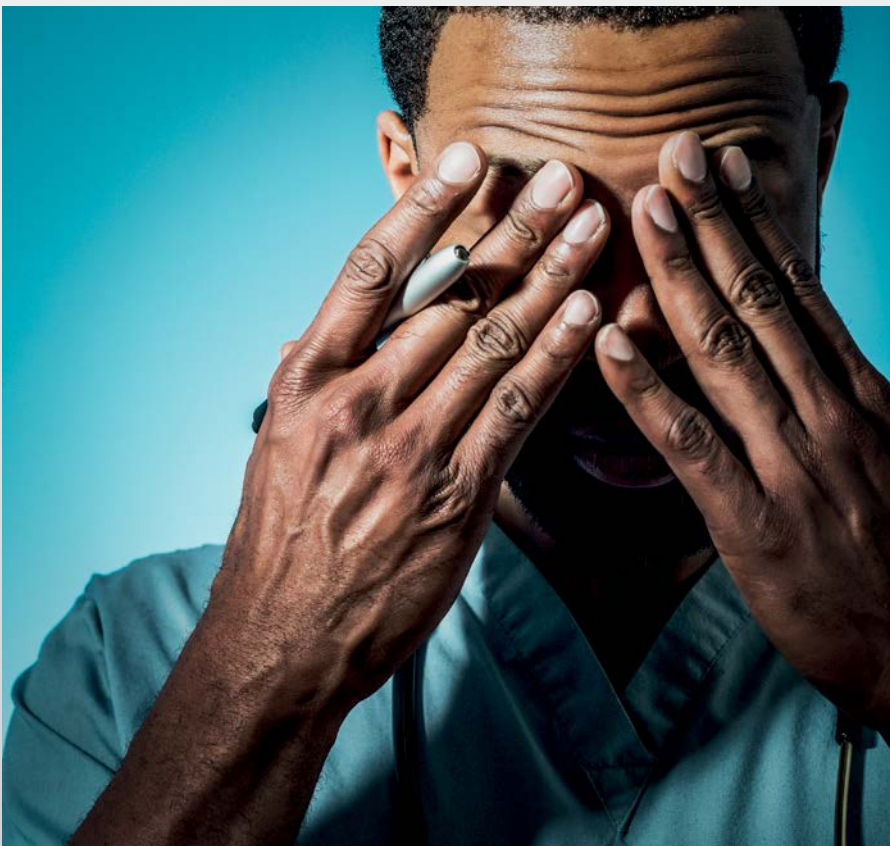
- 1 **Tackling work pressure** - the report encourages hospitals to reduce the burden on juniors of administrative and basic clinical tasks such as filling in request forms, blood taking and data entry. This would free up time for tasks that specifically require a doctor's input.
- 2 **Promoting rest breaks and safe travel home** - sleep deprivation leads to increased clinical error and poor psychomotor abilities, the report says. It calls for moves to "foster a culture that supports staff in taking rest breaks to

ensure they can provide safe, effective patient care" such as the HALT (Hungry, Angry, Late Tired) campaign at Guy's and St Thomas' NHS Foundation Trust which encourages staff to take frequent breaks.

- 3 **Improved access to food and drink 24/7** - almost two-thirds of doctors (65 per cent) told the Royal College of Physicians they had worked at least one shift in the past month without eating a meal while 74 per cent had not drunk enough water. Water should be made easily accessible in clinical areas and 24-hour access provided to healthy, hot food or facilities to heat up food, ideally in staff-only areas.
- 4 **Engagement between board and trainees** - improving engagement between trainees and the board/executive committees could lead to better staff recruitment, retention and productivity as well as improved safety outcomes. Solutions include board members shadowing juniors or attending junior doctor forums.
- 5 **Clearer communication between trainees and managers** - closer working between these two groups can help discover new perspectives and improve services, the report says. It suggests senior trainees and divisional managers use instant messaging apps to handle service pressures and raise issues (for non-patient information).
- 6 **Work-life balance** - rotas that force staff to choose between work and their personal responsibilities can negatively affect job satisfaction and retention. The report suggests involving juniors in designing and managing rotas and introducing flexible rostering practices such as those used in nursing.
- 7 **Rewarding excellence** - introducing formal structures to celebrate good practice should leave fewer juniors feeling undervalued.
- 8 **Wellbeing, support and mentoring** - a massive 80 per cent of doctors say their job causes them excessive stress, which can lead to lower productivity and poorer patient outcomes. The report suggests appointing a dedicated pastoral lead to support doctors, peer-led coaching and mentoring schemes, tailored resilience and stress management training, and critical incident debriefs.

Link: Read the full report at tinyurl.com/y8hf8c7g

Joanne Curran is managing editor of FYi



PHOTOGRAPH: MARY EVANS PICTURE LIBRARY



One of Anton Mesmer's famous healing sessions held in Paris in the 1780s

UNRAVELLING THE MAGIC

Dr Allan Gaw takes a look at the history of placebos in clinical research

TODAY, we take the use of placebos in clinical trials for granted, often assuming that this is a relatively recent innovation. The truth, however, is more interesting and begins in pre-revolutionary France.

In 1778, Parisians who were sick and rich could try a novel treatment from a charismatic physician called Anton Mesmer, who had recently arrived from Vienna.

His clinic was in the exclusive Place Vendôme in Paris. There, you would enter a dimly-lit room and join others seated in concentric circles. At the centre of the room was a wooden tub filled with ground glass, iron fillings and bottles of magnetised water along with metal rods. You would be invited to hold one of these rods on your affected body part. In the background there would be hushed silence punctuated by the ethereal sounds from the glass harmonica – a newly invented musical instrument sounding like a wet finger stroking the rim of a wine glass.

The scene set, Mesmer would appear in a lilac silk coat carrying a metal wand. He would sit en rapport with some patients – knees touching and gazing intently into their eyes. His assistants, reported to have been young and handsome, would also help the magnetic flux by massaging the knees, backs and breasts of patients. This combination of sensory stimuli caused many patients to become entranced or mesmerised and some to faint or convulse. And, of course, many claimed to be cured.

But what was really happening here? Lighting, music, costume, drama and sensuality – what was going on was more ritual than

medicine, more suggestion than treatment, a little more Dumbledore than doctoring. Perhaps in a pre-enlightenment era, this would simply have been viewed as magic. But this was the 1780s – the world had moved on. Now, this magic had to have a rational scientific basis and Mesmer provided it. He believed magnetic fluid flowed into us from the stars and that disease was the result of an obstruction to this flow. His treatment was designed to realign this animal magnetism.

Mesmer's treatments soon became the height of fashion, but he was not without critics, and the establishment would have nothing to do with him. Indeed, the King himself stepped in and appointed a commission to investigate, asking the elderly American Ambassador to France to take the lead. This was none other than Benjamin Franklin. Today we remember Franklin as an elder statesman, but in his lifetime he was among the most celebrated scientists and it was in this capacity that the King sought his help.

Franklin and his colleagues devised a series of experiments using placebos for the first time. Subjects were presented with magnetised objects and with sham objects that looked the same but were untreated. The patients were unable to distinguish the two and variably reported the effects. As a result of these placebo-controlled experiments, the commission was able to conclude that there was no basis to Mesmer's claims. Instead, they explained that animal magnetism "owed its apparent efficacy to the power of suggestion in susceptible or naïve individuals."

Although the term placebo did not enter medical parlance until 1785, it is clear that for centuries before healers had used remedies they knew to be inactive, but which they also knew would appease their patients. Placebo

indeed is Latin for "I shall please". However, Franklin and the Commissioners are credited with being the first to use placebos in a clinical research setting.

Placebos are now an essential part of modern research, used to prevent confounding from the so-called placebo effect, i.e. the effects that an inactive substance, procedure or device may have when administered in a clinical context over and above the effects observed of no treatment. This effect is complex and still relatively poorly understood, but it is undoubtedly real and can significantly impact our evaluation of different treatments if not taken into account. Whatever the treatment, it may be possible to create a matched, but ineffective alternative to act as a control. Benefit may only be claimed if the active treatment produces significantly greater effect than the placebo.

Thus, without the ingenuity of a group of enlightened French scientists led by an aging American diplomat, perhaps today we would not have the placebo-controlled randomised clinical trial. Perhaps our clinical practice might still be based only on observation and anecdote rather than hard evidence. And perhaps physicians would still have wands.

Sources

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- Kaptchuk TJ. Bull Hist Med 1998; 72: 389-433

Allan Gaw is a writer and educator from Glasgow

FINDING YOUR VOICE

CONSIDER the following scenario: A child is admitted to the emergency department with suspected chickenpox. One of the doctors becomes concerned that the child is developing life-threatening complications. He shares his concern with a senior doctor, but his senior tells him to send the child home. The child dies later that night due to varicella complicated by necrotising fasciitis.

Much has been researched about the part which 'authority gradients' can play in errors, but how well is it really understood and applied in healthcare situations? The term was first defined in aviation where it was observed that pilots and co-pilots may not communicate effectively in stressful situations and where there is a significant difference in experience, perceived expertise or authority (Cosby et al, ACAD EMERG MED 2004).

The Institute of Medicine's report from 1999, *To err is human*, first explored the concept in the practice of medicine. Yet relatively little to date has been published regarding the potential role of authority gradients in medical errors, which may remain unrecognised.

In any organisation with different levels of professional stature and seniority, authority gradients can be intrusive – especially when senior staff have influence over career progression in those being supervised. This can make it extremely difficult to speak up and challenge the decisions of people in positions of power or authority.

Some organisations recognise these risks and seek to maintain what is known as a 'shallow authority gradient,' whereby everyone is actively encouraged to contribute opinions/suggestions and an overall consensus emerges that is then acted upon. This can be a desirable approach for managing more routine, non-critical decision processes where there is the luxury of time. The downside to a shallow authority gradient is that in times of stress or

Doctors in training may be reluctant to speak out and question a senior colleague's decision. But risk adviser **Alan Frame** explains why failing to speak up could cost lives

crisis, where leadership and decisiveness are required, critical decisions may not be taken promptly, with adverse consequences resulting from delay.

Conversely, others in a senior position may opt for a 'steep authority gradient' where they are seen as the decision makers and expect instructions to be acted on without question or further discussion. This may be advantageous in times of crisis, but it does not serve to foster shared responsibility and decision-making, nor empower junior colleagues to speak up and speak out to challenge flawed decisions.

In reality, the recognition and use of authority gradients are specific to situational awareness, which requires those in positions of authority to demonstrate self-awareness and be prepared to adjust their preferred gradient approach to meet the prevailing conditions and threats.

One high-profile medical error case where authority gradients played a major role involved a junior hospital doctor administering intrathecal vincristine to a patient instead of the safe indicated intravenous route. Despite this being against the junior doctor's own judgement, he allowed himself to be pressurised by a more senior colleague into doing so. After repeated questioning of his superior he eventually accepted the reassurances given and administered the drug, which subsequently led to the slow and agonising death of the patient.

The aforementioned Institute of Medicine report on medical error acknowledged the importance of team working and the need to improve communication between care givers. Openness should be viewed as a positive attribute to minimise medical errors and poor decision making.

The scope of potential approaches in the management of situational awareness is too vast to do it justice in this article, however, one element that should be fostered is the active encouragement of all team members to speak up and challenge decisions without fear of recrimination. A simple but effective start in developing the required skills could be the agreement of key alert phrases that can be employed by any member of the team to communicate escalating threats.

This could commence with a lower level statement such as "I can see a potential problem here" progressing onto more active statements, such as "I'm worried", and in extreme situations, a direct challenge such as "something is wrong, you need to stop what you are doing / see this patient now!" Adopting this approach has been shown in the aviation environment to assist both the junior and senior officer in distinguishing between curiosity, concern and real threat, resulting in saved lives.

As trainees, it can be difficult to initiate big changes in your working environment, but it is worth taking a step back and considering the authority gradients in your hospital.

Are relationships within the team affecting situational awareness (e.g. are people afraid to share their views or perspectives leading to poor decisions/actions)?

Talk to colleagues to gather their views and then consider raising any issues with your trainer or other senior colleague. Also, you can contact MDDUS to discuss the matter with a medical adviser.

Alan Frame is a risk adviser at MDDUS



Ten years ago, the WHO's Surgical Safety Checklist was launched promising dramatic reductions in operative mortality. Has it lived up to expectations?



SAFE SURGERY SAVING LIVES

THE genius was in its simplicity. In 2006, a group of surgeons, anaesthetists, theatre nurses, experts in human factors, infection control and related areas met under the auspices of the World Health Organization (WHO) for the second Global Patient Safety Challenge: Safe Surgery Saves Lives (SSSL). Harvard surgeon and public health physician, Dr Atul Gawande, led the initiative to consider interventions to improve surgical safety in every country across the world – quite an ask.

An estimated 234 million major surgical operations are undertaken each year worldwide and some seven million people suffer complications following surgery, with one million dying as a result. Around half of these complications are thought to be potentially preventable.

The WHO team focused their efforts on the four “pillars” of safe surgical care:

- infection control
- safe anaesthesia
- teamwork and communication
- measuring surgical capacity and outcomes.

The team recognised that, although standard surgical procedures are undertaken in hospitals and clinics the world over, facilities, equipment and training can vary greatly depending on a range of factors: socioeconomic, political and cultural. So whatever safety measures were proposed had to avoid being resource-dependent.

The result of this work was the WHO *Surgical Safety Checklist*, launched in 2008. The WHO describes it as a “simple tool designed... to bring together the whole operating team (surgeons, anaesthesia providers and nurses) to perform key safety checks during vital phases of perioperative

care: prior to the induction of anaesthesia, prior to skin incision and before the team leaves the operating room”.

Many of the items on the checklist were already routine in most hospitals, such as confirming patient identity, marking the side/site of surgery, checking allergies and the need for antibiotic prophylaxis, and undertaking postoperative instrument and sponge count. The crucial element was ensuring a consistent approach to checking that all these basic safety measures were undertaken.

A pilot study of the checklist conducted in eight hospitals yielded impressive results over a wide variety of healthcare settings, economic circumstances and diverse patient populations. Over a 12-month period, use of the checklist reduced the rate of deaths and surgical complications by more than a third, with inpatient complications reduced by four per cent and inpatient death rates falling from 1.5 to 0.8 per cent.

Numerous studies have since demonstrated similar improvements. For example, a randomised control trial from Norway published in 2015 compared 2,212 control procedures with 2,263 procedures using the checklist and complication rates decreased from 19.9 to 11.5 per cent and in-hospital mortality decreased from 1.6 to 1.0 per cent.

But not all studies have replicated such positive results. Research published in the *New England Journal of Medicine* looking at data from 101 hospitals in Ontario, Canada, found no significant reductions in operative mortality or complications following implementation of surgical safety checklists. Shortcomings in this 2014 study have been cited – more particularly that it did not record how often the checklist was actually used and also the short (three-month) study period. However, the WHO acknowledges that the checklist can only be as effective as its implementation.

It is important that all elements of the

checklist are carried out consistently – not just in part. A study conducted by researchers at Imperial College, London, of operating theatres in five English hospitals found that on average, only two-thirds of the items were checked and team members were absent in more than 40 per cent of cases and failed to pause or focus on the checks in more than 70 per cent of cases. The authors concluded that performance was better when surgeons led and all team members were present and paused for the checklist.

One of the researchers, Professor Nick Sevdalis, commented: “If it’s used for people to tick the box and say, ‘Oh yes, we’ve done it,’ but without really thinking about the patient, without really informing their team members about aspects of the procedure that are relevant to them, I don’t think the checklist will make any difference.”

The WHO also encourages surgical teams to modify the checklist for local use but urges caution in removing items. It states each step has been included because strong evidence suggests it can prevent serious harm. Any team having difficulty completing a particular item is encouraged to find a “local” solution rather than simply removing it. On the other hand, the checklist should also not be “too comprehensive”, as the more items added to it, the more difficult it will become to implement successfully.

One particular aim of the checklist was to encourage improvement in basic clinical processes, as evidenced in a study from the Netherlands that found an increase in appropriate antibiotic use from 56 to 83 per cent, correct site marking from 54 to 92 per cent, and overall clinical safety processes from 34 to 57 per cent.

Such improvements are also associated with an enhanced safety culture within departments – something rather more intangible but perhaps the greatest ongoing benefit of the checklist.

Jim Killgore is associate editor of FYi

GETTING AHEAD IN **NEUROLOGY**



The specialty promises a varied and challenging career

WHETHER it's playing a vital role in stroke care, treating infectious diseases such as meningitis or managing long-term conditions like epilepsy and multiple sclerosis, the specialty of neurology is varied and challenging.

Neurologists diagnose, treat and manage disorders that affect the brain and nervous system. They also treat peripheral nerve diseases that may result in weakness or sensory impairment.

Diagnosis is commonly done by clinical assessment alone but there are a range of advanced imaging and other tests available including genetic testing.

One of the most challenging areas for hospital doctors is the treatment of patients presenting with acute neurological conditions (these include stroke, meningitis, encephalitis and Guillain-Barré syndrome). These patients are then followed up either to clarify the diagnosis or to manage longer-term problems such as epilepsy, multiple sclerosis and Parkinson's disease.

Neurological conditions account for as many as 20 per cent of acute medical admissions but the Association of British Neurologists (ABN) identified a "significant variation of provision of service across the UK". Figures from a recent ABN survey found that a fifth of acute hospitals have access to a neurologist on three days or fewer per week. Access to diagnostic investigations was similarly inconsistent. While 89 per cent of neuroscience centres have access to 24/7 MRI, 72 per cent of district general hospitals (DGHs) do not.

The ABN is calling for national variations in care to be addressed urgently – so what better time to consider a career in this growing field?

Entry and training

Upon successful completion of the foundation programme, it generally

takes seven to eight years of full-time training to become a neurologist. This comprises either two years core training or three years on the acute care common stem (ACCS) programme followed by five years' specialty training (ST3-7). Sub-specialty training in stroke medicine adds a further 12 months.

Trainees must acquire full membership of the Royal College of Physicians UK (MRCP) before entry to ST3. During ST3-7 they must also pass the specialty certificate examination – developed by the Federation of Royal Colleges of the UK in association with the ABN – in order to achieve a certificate of completion of training (CCT).

All trainees will undertake clinical placements of between three and 12 months in a minimum of two neurological training sites. At least one site must include the allied specialties of neurosurgery, neuroradiology, neurophysiology, neuropsychology and neuropathology. At least 12 months should be spent in a DGH-type setting. There is also the option for relevant out-of-programme experience (OOPE) which may include time spent in research or experience in other deaneries or overseas – this can be discussed with your educational supervisor and specialty training committee.

The job

Most neurology services still work on a hub-and-spoke model, with consultants spending part of their time in a DGH and part in a teaching hospital with a tertiary neuroscience centre. Community-based neurology is rare but there are efforts to improve this in coming years. Multidisciplinary work plays a key role with neurologists working closely with other healthcare professionals including physiotherapists, occupational therapists and speech and language therapists.

Many neurologists choose to sub-specialise in areas such as movement disorders, dementia, stroke, MS and other neuroinflammatory disorders, epilepsy, headache, muscle disorders, peripheral nerve disorders, neuro-ophthalmology or neurorehabilitation.

The ABN offers an overview of the kind of patients neurologists see. The most common problems encountered in new patients in clinic, it



says, are headache, weakness, tingling and dizziness. There are also a variety of rare diseases that can present a challenge to the diagnostic skills of even very experienced neurologists. This means that not all neurologists need to be alike. As the ABN says: "The skill mix for an academic neurologist working in motor neurone disease might be very different from that for a stroke neurologist running a hyperacute stroke unit," adding: "But if your strengths include logical reasoning in the face of complex information, communication skills in difficult situations and psychological-mindedness then neurology might be the career for you."

Sources

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- Association of British Neurologists: www.theabn.org



Q&A

Dr Michael Flower,
clinical research fellow
and neurology registrar,
UCL Institute of Neurology

What first attracted you to neurology?

At school, while we understood precisely how the heart, lungs and guts work, I found the mysterious black box of the brain fascinating and exciting.

What do you enjoy most about the job?

Every day I learn something new about how the nervous system works. You'd have thought that by now I'd have a fairly good understanding of how it goes wrong and how to fix it, but every day I see that we're still a specialty in its infancy.

What do you find most challenging?

Routinely, each day, I encounter situations where a mistake can have huge implications - maybe the patient would end up disabled, maybe worse. In other walks of life, maybe in other specialties, that happens occasionally, but working on the ward it's several times a day. And because we have to work fast, we're always exposed to this kind of risk.

Has anything surprised you about the specialty?

Neurology is a big paradox. In one way it's cutting edge, fast paced and highly academic, always pushing forward the limits of our understanding. On the other hand the clinical skills we use every day, and that are still at least as important, maybe more so than all the tests we can do, are rooted in hundreds of years of experience. A good neurologist learns from the past and the future.

What do you consider the most important attributes of a good neurologist?

Logical thinking in the face of a huge amount of clinical information. Seeing the wood for the trees.

What are the most common misconceptions about your specialty?

Neurology is more straightforward than people think. It can seem daunting at medical school, and maybe worse in foundation training, but you learn that with a clear understanding of basic neuroanatomy, a good history and a structured examination it makes much more sense.

Describe a typical working week.

Currently I'm doing a PhD in genetics and cell biology, so a lot of pipette work, cell culture and data crunching. However, on the wards my time is split between seeing referrals on the wards and in the emergency department (ED), going to general or specialist neurology clinics and learning from colleagues at departmental teaching.

What are the tools that you can't live without in your day-to-day work?

Communication skills and a logical mind. And maybe a tendon hammer.

Is there any advice you could give to a final year or FY trainee considering neurology?

Try securing a rotation or taster session with a neurology department to make sure it's for you. Maybe a quality improvement project to find out more about what we do. You don't have to be the most academic trainee - a logical mind, enthusiasm for the specialty and good communication skills are the most important attributes.

Trainee doctors play a key role in hospital record keeping. *FYi* editor **Dr Naeem Nazem** offers practical advice on avoiding common pitfalls

KEEP THE RECORD

WHETHER it is recording your interaction with a new patient, documenting a ward round or assessing a patient individually, trainee doctors' clinical entries form the cornerstone of the medical records for most patients in the hospital. You may not be at the top of the clinical pecking order but your role is critical in ensuring the wider healthcare team is aware of the ongoing management of each patient and delivers effective care.

While your schedule is most likely hectic with barely a chance to stop for a bite to eat, taking time to keep clear and comprehensive notes is crucial. Here are some common risk areas to look out for.

Keep it legible

Most doctors have reviewed medical records containing hard-to-decipher scrawled handwriting. Or perhaps they are littered with abbreviations you have never seen before which could have multiple meanings. Entries like these are unhelpful and potentially harmful to the patient if misinterpreted. Next time you come across one, try to identify the author and seek

clarification from them. Alternatively, ask a colleague to review it with you and always consider if what you believe is written would be clinically appropriate for that patient. It is all too easy during a busy shift to follow a documented action plan blindly.

MDDUS recently dealt with a case in which a patient was inadvertently prescribed 10 times the suggested warfarin dosage by an FY doctor who had misread a medical entry and didn't notice the previously prescribed doses. Fortunately the error was detected in time by the nursing staff.

If you are writing in a medical record, think about how easy it will be for other healthcare professionals (doctors, nurses, pharmacists etc) to read and understand. Patients may also request access, so keep your entry objective and professional. One FY doctor found themselves in an embarrassing situation after they were asked by a patient to explain a written note stating that he was "a nightmare".

MDDUS has also encountered several cases in which nursing staff have misread an FY doctor's prescription, resulting in a medication error. This often occurs when a doctor has attempted to write a new dosage on top of the original entry, rather than rewriting it entirely.

It is also worthwhile to keep in mind that your medical entry may be reviewed many years down the line. For example, a patient may make a claim of negligence or there may be an investigation into an alleged misdiagnosis. It is therefore really helpful if you can print your name after you sign your medical entry and ideally include your GMC number. Many doctors carry a stamp with their name and GMC details as a useful timesaver.

Although not essential, try to make your entry in black ink. This is less likely to fade over time and is also easier to read if the records are photocopied.

Keep it accurate

Remember the medical record you make is sometimes the only available reflection of your actions and rationale. You should therefore take care to ensure that your entry is clear and unambiguous.

MDDUS recently dealt with a case in which a junior doctor was asked out-of-hours if a drain could be removed from a post-operative patient. The patient himself said he was told during the ward round that it could come out. The doctor reviewed the medical records and could only find a "tick" next to





STRAIGHT

the word “drain” in the last medical entry. She presumed this meant it could come out and agreed. However, the intended plan was to keep it in and the tick was to represent the fact that it was draining well. The patient had to have the drain reinserted under ultrasound the following day and complained to the hospital. The FY doctor making the clinical entry could have assisted their colleague by providing a more detailed medical entry. As for the doctor reviewing the entry, she accepted that it was unclear and it may have been more prudent to clarify the meaning with a senior colleague.

Another, rather unfortunate case involved an FY doctor who wrote down blood test results for several patients on peel-off labels to save time. He had intended to stick each label into the appropriate medical records, but inadvertently mixed up two of them. The patient was then deemed unfit for theatre by a consultant due to abnormal liver function tests before the error was spotted by another team member.

Take your time

There is often the temptation, particularly when times are busy, to skim over relevant

parts of the clinical history, examination or management plan. This is especially likely during a busy ward round when you are expected to obtain relevant test results and arrange additional investigations at the same time as documenting the contents of the round. In circumstances like these it is important to take your time and not allow anyone to rush you. If you feel pressured, ask a senior colleague for help. Remember they have also been in your position and it is far better to seek assistance than risk making a mistake. It may also be helpful to ask the consultant or senior colleague undertaking a ward round to review your entry to ensure you have covered the key points. As well as assisting you and the ongoing care of the patient, it is in their own interests to ensure their input has been accurately documented.

Think beyond the notes

The records you keep about a patient are not restricted to their medical records. They include everything from your handover sheet and list of outstanding jobs to the blood test results you have jotted down to file in the notes. Any information from which a patient can be identified is also subject to the requirement

of the Data Protection Act 2018 and General Data Protection Regulation (GDPR). You should therefore think carefully about the information you carry around about patients, how you store it, and whether it is identifiable. Once you have finished your shift and handed over, make sure you dispose of any handover or job lists securely.

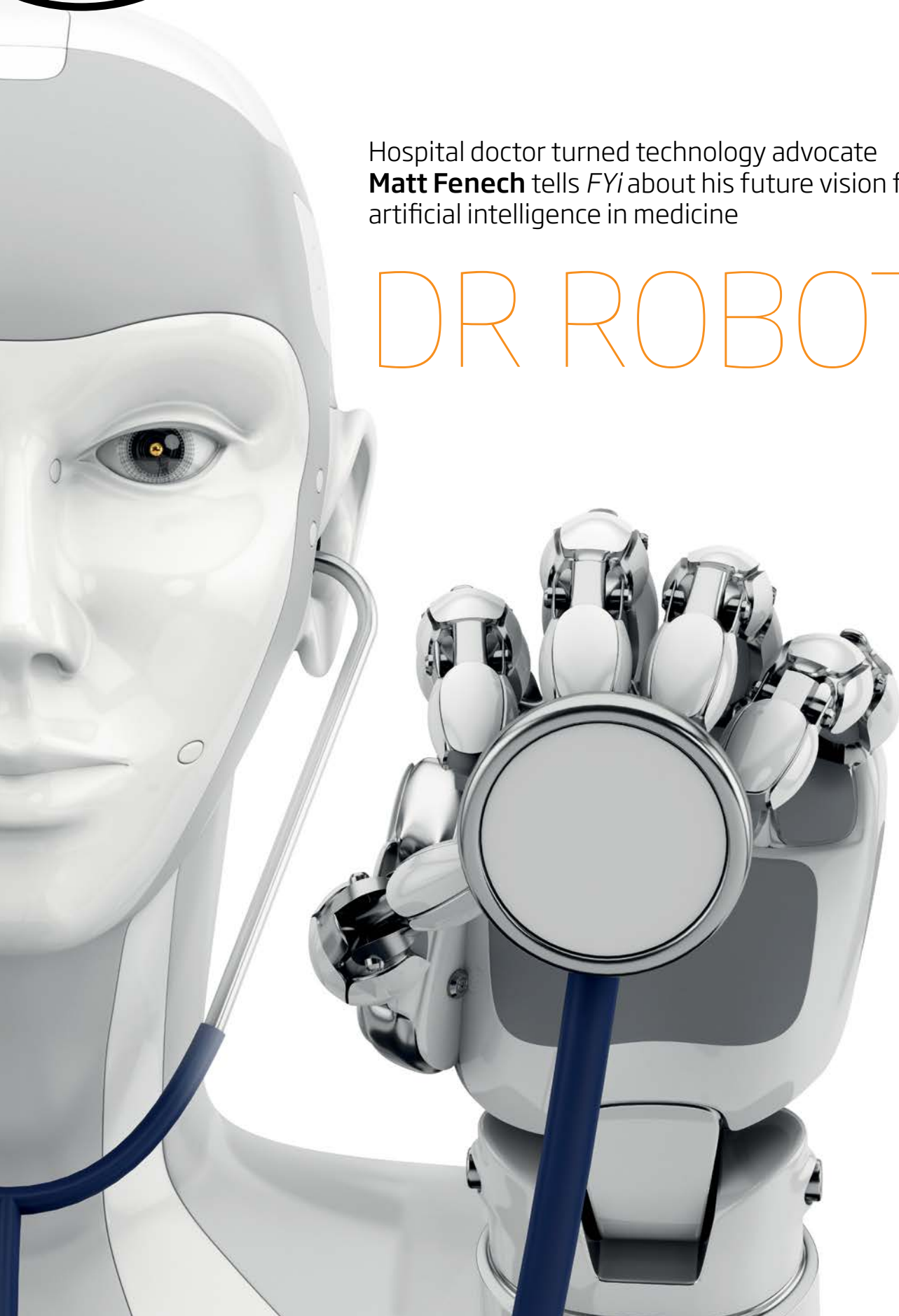
MDDUS recently assisted an FY doctor who was the subject of an adverse incident investigation after throwing their handover list into the ward reception bin. The handover list noted the patients’ initials, their bed number and their outstanding medical needs. The doctor had thought that this did not constitute sensitive patient data as the patients’ full names were not used. However, when taken together as a whole, there was sufficient information to make each patient identifiable, and the Trust regarded it as a serious data breach.

So while it often takes a little more time to record an accurate, clear medical entry, the benefits in terms of risk management far outweigh the additional effort involved.

Dr Naeem Nazem is a medical adviser at MDDUS and editor of FYi

Hospital doctor turned technology advocate
Matt Fenech tells *FYi* about his future vision for
artificial intelligence in medicine

DR ROBOT WI



WHEN we think of artificial intelligence in healthcare, it may conjure up unsettling images of faceless robot doctors treating patients in cold whitewashed clinics. But despite once believing robots would make better doctors than humans, Dr Matt Fenech is certain that it will be a long time before machines can emulate the empathy, warmth and compassion shown by flesh and blood clinicians.

The former NHS research doctor hung up his white coat after 10 years for a career in policy and research and now works as artificial intelligence (AI) project lead at London-based think tank Future Advocacy.

Matt sees great potential benefits for technology in healthcare and says we shouldn't be threatened by computers or view them as replacements for human doctors.

He recently published a report with Future Advocacy which examines

to consider. Do users know they are speaking to a robot rather than a human being? And what happens when something of a sensitive nature is asked? In Oli's case, the young patients are advised to speak to a parent or healthcare professional.

The Future Advocacy report identifies three overarching ethical themes in the use of AI in healthcare: consent, fairness and rights. It raises questions such as how users can give meaningful consent to an AI where there may be an element of autonomy in the algorithm's decisions, or where we do not fully understand these decisions. And who will be held responsible for algorithmic errors? It asks whether these technologies will help eradicate or exacerbate existing health inequalities and how to ensure they are not only accessible to wealthier patient groups. It also wonders whether future patients will have the right not to have AI involved in their care at all.

LL SEE YOU NOW...

how AI can be (and is already being) used in healthcare, with a firm focus on "avoiding the overhyping and under-delivering". It identifies areas where AI can be introduced in healthcare, such as chatbots and personalised health advice, as well as ethical, social and political challenges, including the sharing of personal patient data and the potential to exacerbate health inequalities.

Matt says: "We realise there are great opportunities but there are also risks, so we need to have good policies to mitigate these risks. We are trying to develop the best possible policies by speaking to businesses in the private sector, academics (including computer scientists and philosophers), governments and the general public."

The mere idea of AI in healthcare has raised many eyebrows. Professor Stephen Hawking once said that "AI is likely to be either the best or worst thing to happen to humanity". Matt himself divided opinion a few years ago when he wrote in a blog that "robots would make better doctors than human beings". But he is quick to emphasise that his opinion has since changed.

"I wrote that before we started the [AI in Healthcare] project," he says. "Healthcare is not just making a diagnosis and prescribing a treatment (the robot may be better at that). For the more nurturing aspects of healthcare, I see no evidence that robots are even close to what a compassionate human being can do. The best healthcare is going to be achieved by a combination of technology and humans."

Direct benefits

The definition of AI is hard to pin down. Matt describes it in the broadest sense as "having a computer programme to solve problems", something that is already used in healthcare in the background. But, he says, the more obvious, "in-your-face tools" are just beginning.

During a recent field trip to Alder Hey Children's Hospital in Liverpool Matt saw for himself how AI is directly benefiting patients. Children admitted for treatment can now download an app to their smartphone or tablet that offers access to a specially designed piece of AI tech: chatbot "Oli the elephant". Oli has been programmed to answer commonly asked questions about hospital stays in a way that is easily understandable to children. As well as answering queries such as "what will my operation be like?" and "what happens during a blood test?", the app uses a reward system after procedures to encourage children to engage with care.

Matt says: "I was very excited by this technology because doctors don't always have as much time as we'd like to answer patients' questions. Having an alternative way of helping them is a good thing."

Managing risks

Oli has been well received but, as with all AI, there are ethical questions



Dr Matt Fenech

The report stresses that tools must be developed to address "real-world patient and clinician needs" and to ensure that the voices of patients and relatives are heard.

Better together

Despite his belief in the potential of AI, Matt says robots won't be replacing doctors and nurses "anytime soon" but he doesn't rule out such progress in the next few decades.

His future vision is a positive one: "We want to combine what doctors are good at (the empathy, the negotiation, the communication) with what machines are

good at (like number crunching, data analysis, and the speed of doing so). We want to use the right tool in the right situation."

Reflecting on his past work as an endocrinologist and diabetes specialist, Matt says there were often times when AI could have benefited both him and his patients.

The London-based medic, who moved to the UK from Malta 12 years ago, explains: "Having a quick data-analytic tool to compare blood tests and identify trends would have been much better, particularly in the diabetes clinic where patients bring their blood sugar results and I would spend half the 10-minute consultation looking over them. If I could've fed this into an AI algorithm, for example, it would have freed up time to speak to my patient."

Matt also sees a role for AI in reducing doctors' workloads.

He says: "One of the reasons I left frontline care was because I didn't have enough time to communicate with patients. The pressure is such that you get five minutes to talk to someone with a very complex condition, which is never going to be enough. I constantly felt I was playing catch-up and never doing a good job.

"AI technology could help with those aspects."

Often the arrival of AI is criticised for taking away face-to-face interaction between doctor and patient when, in fact, it could enhance it.

"That is the optimistic view and I think we can get there," says Matt, "but there is also a dystopian view where people sit at home on a computer and a robot talks to you and you never see a doctor or nurse. The technology could do that but I don't think that would be the best approach, nor would people want that."

However, there are circumstances when patients may rather speak to a robot than a human being, particularly in mental health.

"The most important thing in the use of AI is to offer people choice," he adds. "The potential is huge."

- Find out more at www.futureadvocacy.com or on Twitter @MattFenech83

Kristin Ballantyne is a freelance writer based in Glasgow



INCISIONAL HERNIA

Day 1

Mrs W is 46 years old and obese. She attends her GP surgery for a follow-up review having undergone a hysterectomy through a previous caesarean section scar. A practice nurse notes a small amount of clear serous fluid leaking from the wound. Dr K examines the patient and confirms a one-inch superficial wound dehiscence along one end but no sign of infection. She notes in the records that a small amount of "omental tissue" protrudes through the edge of the wound. The GP pushes the tissue back into the wound and repairs the dehiscence with silk sutures.



Day 3

The patient is seen again by the practice nurse who notes the wound is still leaking serous fluid near the edge. Again, there is no inflammation or sign of infection. Dr K examines the wound and recommends removing the sutures and allowing it to heal by second intention. Mrs W is concerned "something is poking out of the hole" but the GP finds nothing, even with the patient standing. The practice nurse cleans the wound and redresses with gauze.



Day 6

Mrs W attends for another review. The wound is still oozing serous fluid but again there is no sign of infection.



Week 8

The practice nurse undertakes a review and finds the wound well healed but she notes a swelling on the right side just above the suture line. She examines the lump and requests that Mrs W make an appointment to see Dr K for further assessment but the patient neglects to do so.



Week 16

Mrs W returns to the practice with a persistent tender swelling above the healed suture line. Dr K makes a diagnosis of incisional hernia at the site of the hysterectomy and she refers the patient to hospital. One month later Mrs W undergoes an attempted laparoscopic repair which has to be converted to an open procedure. She is found to have a large complex sac of omental tissue and small bowel adherent inside. Her recovery from the surgery is long but otherwise unremarkable.

A LETTER of claim is received by Dr K alleging breach of duty of care in her decision to re-suture the wound in the presence of dehiscence and protruding omental tissue. It is alleged that Mrs W should have been referred immediately back to hospital for surgical correction of the underlying defect in the rectus sheath. This would have prevented the incisional hernia and subsequent need for more extensive surgical treatment.

MDDUS reviews the patient notes and statements by both Dr K and the practice nurse. The GP claims that on first examining the patient she noted a small amount of fatty tissue protruding through the wound and that this was pushed back through before placing the sutures. She claims that the reference in the notes to "omental" tissue was made in error and that she had intended to write "adipose".

A primary care expert reviews all the documentation and offers an opinion on the case. He observes that simple wound dehiscence is not unusual and suturing can be effective, but healing by secondary intention is more common in primary care. The claimant's contention of separation of deep layers of the wound (rectus muscle and sheath) evident early on is based on mention in the notes of protruding "omental" tissue. Should a court accept Dr K's contention that this term was used in error then nothing else in the GPs examination would have suggested an incisional

hernia at that stage and the need for referral back to hospital.

Another expert report from a surgical consultant is commissioned in regard to causation (the consequences of any breach in duty of care). He comments that it would be unusual to see omentum in this (Pfannenstiel) type of wound. However, seeing omental tissue evident one week after surgery would be consistent with observations (by the treating surgeon) of a "large area of deep breakdown" within the wound. Had Mrs W been immediately readmitted to hospital the surgeon would have likely reopened the Pfannenstiel wound and resutured the full length to ensure against any other areas of dehiscence. This would have avoided development of an incisional hernia but still necessitated an operation under general anaesthesia.

In view of the legal vulnerabilities in the case over the disputed notes and the contingent causation, MDDUS decides to settle the case in agreement with the member.

KEY POINTS

- Read over notes to ensure against simple errors.
- Obesity and wounds through previous operative incisions are common risk factors for the development of incisional hernias.

OUT THERE

BRAINY BANDAGE A new “smart” bandage with an in-built processor could help treat non-healing chronic wounds from the likes of burns and diabetes. It can check for infection and inflammation by tracking pH and temperature then administer the correct dose of antibiotics when needed throughout the day.

EQUAL OPS FLU A tongue-in-cheek *BMJ* study into “man flu” sought to discover whether “men are wimps or just immunologically inferior”. It found that testosterone may act as an immunosuppressant while oestrogen works in the opposite direction meaning respiratory tract infections may actually present more severely in men.



BABY BOOM More than 8 million babies have been born from IVF since the UK birth of Louise Brown in 1978, the world's first. International monitoring committee ICMART estimates that more than half a million IVF babies are born each year, with Spain and Russia the most active countries. European IVF pregnancy rates are around 36 per cent.



WHAT ARE WE LOOKING AT?

Stumped? The answer is at the bottom of the page

PHOTOGRAPH: TED KINSWAN/SCIENCE PHOTO LIBRARY



Pick: Amazon Prime Video – The Resident

Directed by Rob Corn et al. Starring Matt Czuchy, Emily VanCamp, Bruce Greenwood.

IT'S hard for new medical dramas to offer up anything viewers haven't seen a million times before, but *The Resident* seems to be trying to make cynicism its unique selling point. It lifts the lid on the dark side of modern American healthcare, where staff are given lessons on upselling expensive tests and bosses try to bribe other hospitals to take uninsured patients in need of pricey treatment. The doctors are portrayed as deeply flawed, borderline egomaniacs with chief

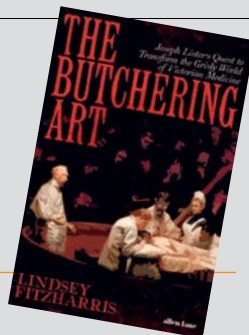
surgeon Randolph Bell (Greenwood) so determined to preserve his reputation he would rather risk patient death than reveal his hand tremor. At the heart of it all is Conrad Hawkins (Czuchy), a brilliant, brash third-year rock-star resident who refuses to play by the rules. With the help of nurse and old flame Nic (VanCamp) he will do anything to help his patients. Plots can be predictable and it is tricky to make characters at once flawed and likeable for audiences, but it is refreshing to see the economic reality of US healthcare laid bare.

Season two starts on Universal TV later this year.

Book Review: The Butchering Art

By Lindsey Fitzharris,
Allen Lane, £11.89, hardcover, 2017

Review by Dr Greg Dollman



IN one of his regular letters to his father, Joseph Lister wrote: “Thou canst hardly conceive what a high degree of enjoyment I am from day to day experiencing in this bloody and butchering department of the healing artist”. Lindsey Fitzharris’ *The Butchering Art* allows a glimpse into the personal and professional life of one of the most influential figures in modern medicine. And her description of “the bloody” and “the butchering” provided me with possibly the same high degree of enjoyment that Lister derived from his scientific art.

Fitzharris chronicles Lister’s journey from an ambivalent medical student (a Quaker, he had considered a life in the ministry) to his appointment as Queen Victoria’s personal surgeon (Lister once quipped: “I’m the only man who has ever stuck a knife into the Queen”) and the

multiple honours that were bestowed on him in later years, including a knighthood and presidency of the Royal Society. In between, she describes Lister’s unwavering pursuit of antisepsis, from London to Edinburgh (and around the world) and back again.

The subtitle of this history is *Lister’s Quest to transform the Grisly World of Victorian Medicine*. And grisly it certainly was. The book describes the squalor of the hospitals (surgery may have been seen as lifesaving but hospitals were considered places of death, usually for the poor), brutal and rapid surgical procedures without anaesthesia (Fitzharris relays a possibly apocryphal tale of a surgeon who sliced off his assistant’s fingers during an leg amputation), and the putrid, sawdust covered places of surgery that really were ‘theatres’ (open to the public where matters of life and death were considered entertainment).

Apart from the story of medicine, *The Butchering Art* also provides a fascinating history of life in Victorian Britain, with vignettes about people (including Harvey Leach, “the shortest man in the world” who joined PT Barnum’s Circus), places (such as Crystal Palace and the Old Bailey) and processes (decorum and education).

While Fitzharris’ book is a delight to read, I was disappointed by the seeming overly optimistic portrayal of Lister. The book glosses over the depression and neurosis that appears to have affected this great man. The history only scratches the surface of this fascinating era of medicine, and it left me longing for more.

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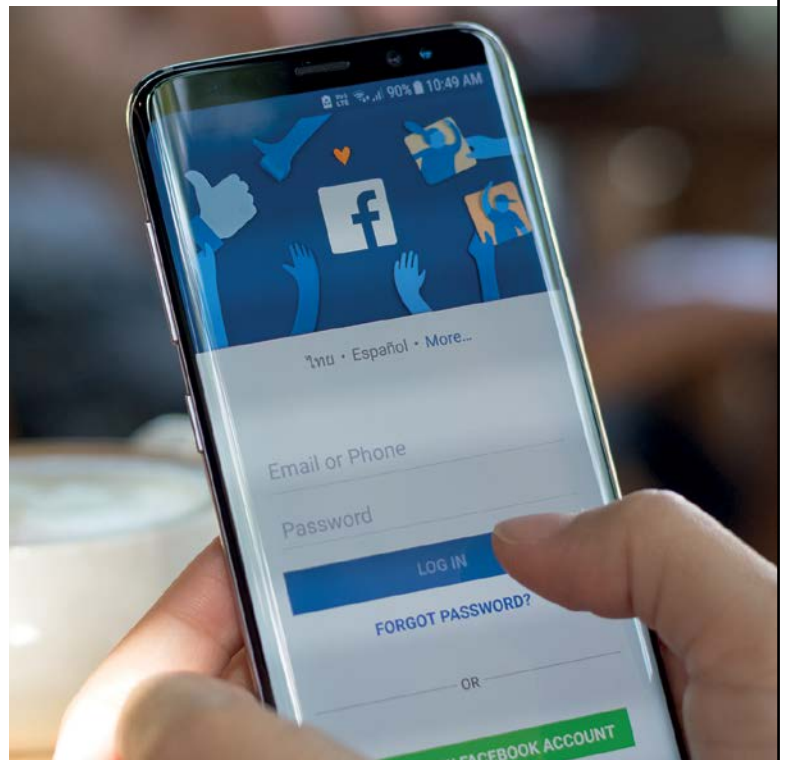
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